S. HRG. 98-549

EMERGING TRENDS IN THE ARMY'S AMMUNITION PROGRAM

HEARING

BEFORE THE

SUBCOMMITTEE ON PREPAREDNESS

OF THE

COMMITTEE ON ARMED SERVICES

UNITED STATES SENATE

NINETY-EIGHTH CONGRESS

FIRST SESSION

SEPTEMBER 22, 1983

Printed for the use of the Committee on Armed Services

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON: 1984

29-075 O

5201-18

COMMITTEE ON ARMED SERVICES

JOHN TOWER, Texas, *Chairman*

STROM THURMOND, South Carolina
BARRY GOLDWATER, Arizona
JOHN W. WARNER, Virginia
GORDON J. HUMPHREY, New Hampshire
WILLIAM S. COHEN, Maine
ROGER W. JEPSEN, Iowa
DAN QUAYLE, Indiana
JOHN P. EAST, North Carolina
PETE WILSON, California
DANIEL J. EVANS, Washington

SAM NUNN, Georgia
JOHN C. STENNIS, Mississippi
GARY HART, Colorado
J. JAMES EXON, Nebraska
CARL LEVIN, Michigan
EDWARD M. KENNEDY, Massachusetts
JEFF BINGAMAN, New Mexico

JAMES F. MCGOVERN, *Staff Director and Chief Counsel*
JAMES G. ROCHE, *Staff Director for the Minority*
ALAN R. YUSPEH, *General Counsel*
CHRISTINE C. DAUTH, *Chief Clerk*

SUBCOMMITTEE ON PREPAREDNESS

GORDON J. HUMPHREY, New Hampshire, *Chairman*

BARRY GOLDWATER, Arizona
ROGER W. JEPSEN, Iowa
PETE WILSON, California

CARL LEVIN, Michigan
EDWARD M. KENNEDY, Massachusetts

CONTENTS

Page

Pihl, Gen. Donald S., Director of Combat Support Systems, Office of the Deputy Chief of Staff for Research, Development and Acquisition, accompanied by Col. Robert J. Hudak, Chief of Munitions Division, Combat Support Systems, Office of the Deputy Chief of Staff for Research, Development and Acquisition; Joseph I. Byron, Chief of Development, Acquisition and Budget Team, Combat Support Systems, Office of the Deputy Chief of Staff for Research, Development and Acquisition; and Lt. Col. Thomas Lewis Hennigh, Copperhead System Coordinator_____

EMERGING TRENDS IN THE ARMY'S AMMUNITION PROGRAM

THURSDAY, SEPTEMBER 22, 1983

U.S. SENATE,
SUBCOMMITTEE ON PREPAREDNESS,
COMMITTEE ON ARMED SERVICES,
Washington, D.C.

The subcommittee met in open session, pursuant to notice, at 12:34 p.m., in room SR-222, Russell Senate Office Building, Senator Gordon J. Humphrey (chairman) presiding.

Present: Senators Humphrey and Levin.

Staff present: Michael B. Donley and David S. Lyles, professional staff members; and Marie Chaillet, staff assistant.

Also present: Dennis P. Sharon, assistant to Senator Goldwater; Ron Kelly, assistant to Senator Humphrey; Pat McKim, assistant to Senator Wilson; and Ralph White, assistant to Senator Levin.

OPENING STATEMENT BY SENATOR GORDON J. HUMPHREY, CHAIRMAN

Senator HUMPHREY. Good afternoon. The Preparedness Subcommittee meets this afternoon to review the Army's ammunition program and the current status of the Copperhead cannon-launched guided projectile.

When the subcommittee last met on this issue in April the future of the Copperhead program was in some doubt. Many in Congress were uncertain about system reliability, affordability, and the Army's determination to proceed with the program.

Five months later, the Congress has authorized the program at the requested level. At the same time, however, Congress has made significant reductions in the defense budget, including a $2 billion cut from the Army's requested authorization.

In addition, the Army has recently completed work on its fiscal year 1985 budget, providing yet another opportunity to review the viability of the Copperhead program in a resource constrained environment.

The purpose of this hearing is to review the emerging trends in ammunition procurement in light of these developments and determine what management techniques could be used to promote efficiencies in production, especially in high value programs such as Copperhead, even though the amounts available for ammunition procurement between now and fiscal year 1989 will be considerably smaller than projected last March.

I anticipate that one important byproduct of this hearing will be an increasing awareness among Army leadership that, even though Congress has mandated defense cuts—which I personally do not support—there are some who believe the ammunition budget to be of equal importance to the Army's other accounts and an important measure of serious defense planning.

To help sort out these complex issues, we are pleased to welcome Brig. Gen. Donald Pihl, Director of Combat Support Systems, Office of the Deputy Chief of Staff for Research, Development, and Acquisition; Col. Robert Hudak, and Mr. Joe Byron, Chief and Deputy Chief of the Munitions Division.

Gentlemen, good morning.

General Pihl, do you have a statement?

STATEMENT OF GEN. DONALD S. PIHL, DIRECTOR OF COMBAT SUPPORT SYSTEMS, OFFICE OF THE DEPUTY CHIEF OF STAFF FOR RESEARCH, DEVELOPMENT, AND ACQUISITION, ACCOMPANIED BY

Col. Robert J. Hudak, Chief of Munitions Division, Combat Support Systems, Office of the Deputy Chief of Staff for Research Development and Acquisition;

Joseph L. Byron, Chief of Development, Acquisition and Budget Team, Combat Support Systems, Office of the Deputy Chief of Staff for Research, Development and Acquisition; and

Lt. Col. Thomas Lewis Hennigh, Copperhead System Coordinator.

General PIHL. Yes, sir, Mr. Chairman and members of the committee, I have a statement. I will be pleased to submit that for the record rather than read it and use the time to respond to your questions, if you would like.

Senator HUMPHREY. Thank you, General.

[The prepared statement of General Pihl follows:]

PREPARED STATEMENT OF BRIG. GEN. DONALD S. PIHL, DIRECTOR, COMBAT SUPPORT SYSTEMS, OFFICE OF THE DEPUTY CHIEF OF STAFF FOR RESEARCH, DEVELOPMENT, AND ACQUISITION, DEPARTMENT OF THE ARMY

Mr. Chairman and members of the subcommittee, it is a pleasure to appear before this subcommittee today to discuss the Army's ammunition program.

The fiscal year 1984 budget contains $2,334.2 million for procurement of ammunition hardware and support of the ammunition production base. This is an increase of $212 million over our fiscal year 1983 appropriation. However, the fiscal year 1983 appropriation was 20 percent less than the amount requested for that year. The fiscal year 1983 reduction will result in a serious curtailment of training for our soldiers and only a small increase in our war reserve stocks. Our fiscal year 1984 request for $2,334.2 million, therefore, ends up at about the same level as our fiscal year 1982 appropriation.

Fiscal year:	*Millions*
1982	$2,322.6
1983	2,122.0
1984	2,334.2

The fiscal year 1984 ammunition budget request consists of $2,056.9 million for hardware and $277.3 million for production base support.

Ammunition hardware provides for worldwide training consumption through the fiscal year 1984 funded delivery period, procurement of modern hardware, and buildup of war reserve stocks, toward the authorized acquisition objectives.

The hardware request is broken out into the following categories:

Category:	*Millions*
Training	$543.9
War reserve	1,471.7
Nonhardware	41.3
Total	2,056.9

The hardware request broken down by type is 40 percent for artillery, 20 percent for small arms, 11 percent for tanks, and 11 percent for propelling charges and fuzes. The remaining 18 percent is miscellaneous (mortar, atomic materiel, nonhardware, etc).

	Percent	Amount (millions)
Type of ammo:		
Artillery	40	$830.2
Small arms	20	407.6
Tank	11	225.7
Propellant charges and fuzes	11	213.7
Miscellaneous	18	379.7
Total	100	2,056.9

Now let's address each one of these "types of ammunition" briefly.

ARTILLERY

Funds being requested in support of artillery ammunition constitute 40 percent of the total ammunition budget. Within the $830.2 million, 52 percent supports war reserve buildup of the new modernized 155 MM and 8 inch artillery improved conventional munitions (ICM); $75 million is being requested for the 155 MM Copperhead. The fiscal year 1984 Copperhead funding, along with the fiscal year 1983 reprograming action currently being addressed by congressional committees, provides additional war reserve inventories of the only antitank projectile with laser terminal homing capability.

SMALL ARMS

Of the $407.6 million requested, $109.3 million, or 27 percent is for the Sgt. York/Divad (40 MM) system; $74.7 million, or 18 percent, is for the 5.56 MM all types ammo; and $18.9 million, or 5 percent, is for 30 MM ammunition to be used in the new AAH–64, advanced attack helicopter. The remainder of $204.7 million is to fund war reserve and training requirements for 7.62 MM, cal .50, and other small caliber systems.

TANK

The funds associated with 105 MM tank training and war reserve ammunition requirements are for rounds fired from the main gun cannon mounted on tank models M1, M60 series tanks, and the M4845. The budget includes funds for 120 MM ammunition for the new 120 MM gun system on the M1E1 Abrams tank. Funds are also being requested for 165 MM target practice training rounds which are fired from the combat engineer vehicle (CEV).

PROPELLING CHARGES AND FUZES

Propelling charges are requested to support war reserve and training requirements for 155 MM and 8 inch projectiles. Proximity ,point detonating, and mechanical time fuzes are required to compliment on-hand projectile assets at the end of the fiscal year 1984 funded delivery period.

MISCELLANEOUS

Mortar: The budget request funds for the procurement of rounds for the 60 MM, 81 MM, and 4.2 inch mortar systems for both training and war reserve stocks.

ATOMIC MATERIEL

Funds of $112 million requested provide for three elements: Nuclear weapons support materiel and production of DOD components for 8-inch and 155 MM nuclear munitions.

NONHARDWARE

Two line items-components for renovation at $21.9 million and components for prove-out at $12.5 million, are the major programs in this category.

ACTIVITY 2—AMMUNITION PRODUCTION BASE SUPPORT

The ammunition production base fiscal year 1984 program of $277.3 million. In accordance with Department of Defense guidance, the Army is emphasizing procurement of war reserve stocks and financing only those production base projects needed to meet peacetime production requirements. The following summarizes our ammunition production base request.

	Millions
Provision of industrial facilities	$235.6
Layaway of industrial facilities	17.3
Manufacturing technology program	24.4
Total	277.3

PROVISIONS OF INDUSTRIAL FACILITIES

The fiscal year budget includes $30.5 million to support production and replace equipment at 16 active ammunition production plants.

A total of $205.1 million is requested for initial production facilities and modernization and expansion projects.

Three new projects totaling $90.3 million provide facilities for chemical binary munitions.

LAYAWAY OF INDUSTRIAL FACILITIES

The $17.3 million requested for layaway is for the protection and preservation of equipment and facilities no longer required for active production, but which much be retained for future or mobilization production.

MANUFACTURING TECHNOLOGY PROGRAM

The $24.4 million for manufacturing methods and technology (MM&T) is associated with the modernization and expansion program. This program improves ongoing production processes to achieve cost reductions and enhanced health, safety, and energy conservation characteristics.

We have a balanced program and solicit your support in this budget.

COPPERHEAD

Senator HUMPHREY. Gentlemen, will you give us a rundown on the status of Copperhead, what changes have taken place and how it is tracking since the system was first included on the list of those weapon systems with cost overruns exceeding 15 percent several months ago.

What has been done as a result of that listing?

General PIHL. Yes, sir.

When the Copperhead weapon system breached the 15-percent threshold we at that time had taken the Copperhead program out of our budget. For that period of time we took the Copperhead out of the budget for two reasons.

One was the cost of the weapon system and program acquisition cost and its reliability performance at the time. Since then we have gotten a handle on the reliability problem.

In our recent testing we now have Copperhead up to a cumulative reliability of 82.9 percent in the lot acceptance testing that we are doing at the White Sands Missile Range.

The question for the Army remains the program cost. At the present time Copperhead, when you divide the 30,462 rounds in the program into the $1.6 billion program, we have a program acquisition cost of $54,400 a round.

We are addressing that on two grounds. We have had a team together from the Army, Darcom, Department of the Army Materiel Command, as well as the contractor, who have gone to Martin-Marietta to look at ways in which we can improve the efficiencies in the plant to lower the cost of Copperhead.

We believe for a modest investment within the Copperhead program of around $21 million we can save approximately $160 million in the program, the major improvement being a new microprocessor which will help reduce the cost.

We continue to test Copperhead in a lot acceptance test to insure that the reliability stays above the 80-percent goal which has been established by the Defense Department.

In addition, in our POM budget deliberations on cost the question of cost-quantity relation comes up. We have a program of 30,462 rounds which supplies the rapid deployment force, Korea and Europe.

At the present time that is the $1.6 billion program. We, in our deliberations in formulating the 1985 budget, are taking a look at the quantity relationship, but at this time have made no decisions to increase beyond the 30,000-round level.

Senator HUMPHREY. Let me back up.

There is a good deal of skepticism about the need or effectiveness of the system. The Army at one time shared that concern.

What is responsible for the change in the Army's position?

General PIHL. Sir, I think in very plain terms the fact that this is a very complex device and at one time we were having reliability problems. It has somewhere around 1,200 parts.

I think the change in that is that we finally now have the system working, it is operative. It does what it is supposed to do when a laser designator spot is put on a hard target, an armored vehicle, when the round is fired out of a Howitzer the round will track to the target and kill the tank.

I guess the major change then is its increase in reliability, performing the way it was designed to perform.

Senator HUMPHREY. What were the problems that you have overcome?

General PIHL. Some problems with the Seeker, sir. As I recall the history, there were 131 hits out of 158 rounds fired.

I have with me Lieutenant Colonel Hennigh who is the system coordinator for Copperhead. If I could introduce him, I think he can give you some sensing for these problems.

Senator HUMPHREY. You are free to call on anyone you choose.

General PIHL. If I can bring him up to the table.

Lieutenant Colonel HENNIGH. Sir, I am Lieutenant Colonel Hennigh, the Army's system coordinator for Copperhead.

At the time we entered production we really weren't ready to start. If I could just provide some examples.

We began with a prescribed buildup rate consisting of what the contractor thought he could provide us. Due to prove-out problems

prior to beginning of production, we were experiencing low yields, had difficulty bringing piece parts together in a subcomponent, assembly of subcomponents into major subassemblies and then bringing it all together in a fully assembled round.

We had a very low cost prove-out called initial production facilitation. The purpose of that was to provide a pilot so that we could resolve all production problems. This didn't happen as we had planned.

Nevertheless, we went ahead and started production consistent with the low rate. Now, this was in October 1981 when we began.

As we proceeded into the first 3 or 4 months, the contractor was not able to meet his rate and he was running into difficulties that he did not anticipate.

In the first article test and subsequent tests thereafter, the reliability goals were not being met.

In June 1982 we conducted the OSD directed reliability demonstration. Our goal was to achieve and demonstrate 80-percent reliability. We in fact demonstrated 67 percent.

Reflected in that percentage were problems we had experienced in the startup. It dealt principally with the way the people actually put the parts together.

Senator HUMPHREY. A quality control problem?

Lieutenant Colonel HENNIGH. Yes, sir.

We went back and made a comprehensive review of all the manufacturing procedures. We, the Government, did it along with the contractor.

Between July and November, by the mere application of improved quality assurance procedures in the line, we were able to bring the reliability from 67 percent to above 80 percent. If I recall, it was 82 or 83 percent. We demonstrated this in lot acceptance testing.

The things we did to make the reliability better were things that affected our reliability in June 1982.

For example, a part that is put around the aft end of the projectile which helps seal the propellant gases to give it the correct propulsion when it is fired. If this part is not properly lubricated, it can create a binding and when the projectile leaves the weapon it will be spinning too rapidly.

If that occurs, you can't maintain proper roll control. So, a simple error in manufacturing, if that occurs, gives you a very complicated effect. If you can't maintain proper roll control, you have a major problem.

Senator HUMPHREY. I understand.

On the test data you cite recently in the vicinity of 67 percent earlier, later 83 percent, most recently 82.9 percent; are these tests precisely the same tests? Have they been changed in any way? Are these directly and fully comparable?

Colonel HENNIGH. That is correct, sir. Today we follow the same procedures in preparing the rounds for firing and in the conduct of firing those rounds as when we conducted the first demonstration in June 1982.

Senator HUMPHREY. The Army has not in any way changed the testing procedure to improve the performance?

Colonel HENNIGH. No, sir.

Senator HUMPHREY. The Army is considering spending $21 million to improve the producibility and product assurance of the Copperhead.

Why is that going to be an Army expense as opposed to a contractor expense?

General PIHL. Sir, the process will be shared with the contractor. The contractor will also put money into that process as well.

Senator HUMPHREY. How much? What ratio?

Colonel HENNIGH. I will have to provide that for the record.

[The information follows:]

PRODUCIBILITY/PRODUCT ASSURANCE COSTS

The contractor's investment will be $1.2 million; the government's will be $20.1M. The estimated net savings return is from $121M to $175M for the total program of $1.6B. The most significant savings will come from developing a new microprocessor and gyroscope for the guidance section. Its cost will be $4.7M and will yield a net savings of $26M to $39M.

Lieutenant Colonel HENNIGH. What I would like to add, sir, is that these are improvements. I have a list of them with me. It is quite lengthy, but these are producibility improvements which we have been considering for the past 2 years and our implementation of them was delayed due to perturbations in the funding.

Senator HUMPHREY. Going back again to the fundamental need for this weapon, General Pihl, you stated or implied at least that the Army's decision not to go ahead with Copperhead was based on reliability?

General PIHL. Reliability and cost, yes, sir.

Senator HUMPHREY. Nevertheless, as recently as July 1982 it was meeting the 80 percent and exceeding the 80-percent criterion and yet at that point the Army still didn't want it.

Even though it was meeting the reliability, exceeding the reliability criterion established, the Army still didn't want it. Why was that?

General PIHL. Sir, I guess the word "want" in terms of the total systems is the issue. We at the time had, and do today have, affordability problems in getting all the major systems we need.

So, the requirement for Copperhead was there. The Army wanted Copperhead, but did not fund it at that time within the competing requirements.

I don't think the word "want" is the one I would lean on.

Senator HUMPHREY. Is the latest reversal from no to yes a DOD decision or Army decision?

General PIHL. It is an Army decision. The Army went to the Defense Department and asked the Secretary of Defense to support us. We were in our deliberations at that time putting together our budget.

We saw the need for Copperhead to perform in the range bands that Copperhead performs in as a tank killer. We are still fighting larger numbers of tanks than we have and we want our artillery systems to have the capability of killing those targets.

The Army was committed to Copperhead and went to the Defense Department to ask for restoration of the program.

Senator HUMPHREY. Now you have decided that you do want it.

What is different about the affordability issue? Obviously it is trade

off. If you want more of these, you have to have less of something else.

What is different today when you do want it, that you consider it affordable, compared to a year ago when you didn't want it, considered it unaffordable? What is the difference?

General PIHL. Sir, I think the difference is in debating the armor-antiarmor application in terms of how we intend to fight, the argumentation of supporting killing enemy vehicles in a range band beyond the range of tanks and TOW missiles.

Where Copperhead is the only system we have to do that we were able to articulate an integrated package, a ground locator designation system and a Copperhead vehicle that gives us more killing effect on the battle field than we have.

Senator HUMPHREY. Is there some new element in that package that was not present a year ago when you didn't want the system?

General PIHL. I don't think there was any new element in that package other than perhaps some resolve on the part of the decision-makers to get on with it.

Senator HUMPHREY. It was a fundamental decision about the need for this weapon against armor, a change of mind apparently?

General PIHL. Yes, sir.

Senator HUMPHREY. Let us address the matter of the stated requirement.

How was that arrived at, the 30,000-odd rounds?

General PIHL. The procurement objective of 30,462 rounds was arrived at by that amount of total obligational authority we could devote to the Copperhead system.

The requirement is for 103,000 rounds as far as our objective is concerned. We took a look at the competition for resources within the total Army and when we balanced out Copperhead we could afford the 30,462 rounds.

Senator HUMPHREY. You have a requirement for 103,000?

General PIHL. In terms of requirements as we have requirements for other Army systems: yes, sir.

Senator HUMPHREY. That is even more astounding to me. I am not trying to be unfriendly, but a year ago it was felt there was no need for this and yet today you say you have a need for 103,000 rounds.

That is a tremendous reversal in my opinion.

General PIHL. I think one of the facts bearing on the problem, sir, is that we looked very hard at the kind of systems that can be applied around the world in the various scenarios in which we might be called upon to fight.

Where we can get M–1 tanks, TOW's, and where we can get the Bradley fighting vehicle, TOW's and the Copperhead round was one of the key elements in the decision.

As we took a look at the rapid deployment force, given the capability to use 155 millimeter towed and self-propelled howitzers, one of the things we brought in the scenario is where you could not bring the M–1 tank as quickly as we liked to, the Copperhead filled the need.

There was a serious consideration of a tank-killing capability that Copperhead provides. As you look at the 30,000 rounds, the preponderance of those weapons go to the rapid deployment force and that was a key component of the decision on the 30,000-round quantity.

Senator HUMPHREY. Senator Levin?

Senator LEVIN. I have a couple of questions on Copperhead while you are on that subject.

I met with Dr. Sculley last July and asked him whether or not the Army has reduced its requirement for the nonsmart conventional artillery shells now that you have decided to produce Copperhead. He thought the Army should reduce its conventional artillery munitions requirement in light of the fact that Copperhead will be produced. However, he said the Army has not yet done so. He also said some kind of study was underway to look at that question.

I am wondering whether you agree the Army can reduce its requirement for conventional artillery munitions since we are going to continue to produce Copperhead?

General PIHL. Senator Levin, the question, first of all, if I may take it in the order you stated it, the study is not yet complete and I want to be clear on that.

The Concept Analysis Agency which does our rate computations for munitions is performing that effort. We are looking at DP ICM M483 155 millimeter and how it relates to Copperhead.

As we play our force-on-force war games, to play Copperhead in that game we have more Copperheads than the 30,000 rounds I just mentioned to Senator Humphrey.

We also have not yet bought the amount of rounds we need in the dual purpose ICM in order to do the kind of defeat that we need to, one, slow down the rate of advance of the enemy, that is, the number of red kills that are achieved versus the number of blue survivors.

Perhaps too simplistic an answer is that we don't have enough of either round at this time to put us in a tradeoff position. I think, however, over time if you get the Copperhead up to the levels that we are talking about and eventually buy an adequate amount of DP ICM, we will then be able to find out what that transfer function is and in future budgets make those kinds of savings. I don't think we are prepared to do so at this time.

Senator LEVIN. My question is whether or not we are going to reduce the requirement, not how quickly we meet it or whether we have met it.

General PIHL. Yes. At this time we have not yet reduced the requirement, but I think there will be a time when we can.

Senator LEVIN. Whether we reduce the requirement depends not only on the percentage of requirement we achieve?

General PIHL. I understand your question, sir. In terms of looking at the rates as far as the analysis is being performed, we have not yet traded out a requirement for DP ICM.

Senator LEVIN. Do we have to produce any more before we make that trade off? Can't we make that trade off so that we can adjust our requirement so that we know how far short we are?

We are trying to make budget decisions. Twenty percent of our requirements lets us get there a little bit faster. If we reduce our requirement in half, it is 40 percent of our requirement, it is not very good.

We are making budget tradeoffs. Can't we decide whether to reduce the requirement without getting any closer to it?

General PIHL. That could be done, sir, but it has not been.

Senator LEVIN. Isn't that the purpose of the study?

General PIHL. The purpose of the study, sir, is to see how well we perform in a red-blue scenario against the enemy.

Senator LEVIN. Does that affect the requirement?

General PIHL. Yes.

Senator LEVIN. Isn't that the ultimate purpose of the study to tell us what the requirement should be?

General PIHL. Yes.

Senator LEVIN. When will the study be finished?

General PIHL. I have with me an officer who can answer that question.

Senator LEVIN. A member of my staff tells me whether I am asking the right questions. So I know the importance of looking at someone else.

General PIHL. By the end of October, sir.

Senator LEVIN. Before we get the new budget we will know whether there has been an amendment to the requirement on the conventional?

General PIHL. Yes; by the time the January budget comes forward we will have taken a look at our requirement for ammunition based on new rates.

Senator LEVIN. At this point you are not able to say theoretically whether or not we are going to produce the 100,000 Copperheads and reduce our requirement for conventional ammunition?

General PIHL. I am not prepared.

Senator LEVIN. Isn't it logical there ought to be some impact on other requirements? Suddenly we are going to produce 100,000 of something that we weren't going to produce?

General PIHL. The logic is clear to me and I understand why Secretary Sculley would say that also.

What we are trying to do, however, is to take a look at what that transfer would be in terms of targets. That is the key as I see it.

Senator LEVIN. I have one other question on Copperhead, Mr. Chairman, and then I will be done with this area of questioning.

As I understand it, you have a recommendation from a production review team for investment of $21 million over 4 years to yield some kind of savings of maybe $160 million on Copperhead.

Is that investment to buy competition? What is it? Are you familiar with it?

General PIHL. Yes, sir, I am.

Senator LEVIN. What are we going to get for the $21 million?

General PIHL. We will get an improved microprocessor for the Seeker and the Copperhead as well as some efficiencies in the way the plant produces Copperhead.

Senator LEVIN. What part of that is the microprocessor, the $21 million? Do you know?

General PIHL. That question is Lieutenant Colonel Hennigh's area.

Lieutenant Colonel HENNIGH. The investment in the microprocessor is $4.7 million.

Senator LEVIN. That is not for additional competition?

Lieutenant Colonel HENNIGH. No, sir.

Senator LEVIN. That leaves $17 million. That is for what? Give us a breakdown.

General PIHL. I will be happy to submit it for the record, but we can give you some for instances.

[The information follows:]

INVESTMENT BREAKDOWN

The production review team recommended investment was actually $20.751 million. The balance of $16.051 million is as follows:

Item	*Recommended investment*
Pyrotechnic devices	$121,000
LAP fixtures	95,000
Electronic components	700,000
Roll rate sensor	2,757,000
Control actuator system	3,679,000
PWB redesign	300,000
1 piece control housing	75,000
Forged warhead	100,000
Universal gate array	240,000
Squib driver hybrid	200,000
Sample and hold LSI	200,000
Wing release mechanism	258,000
Rotary switch (new design)	173,000
Fuze 2d source	2,868,000
Injection molded parts	99,000
Optics (rotor mirror)	10,000
Microelectronic components	78,000
Detector preamp	100,000
Guidance assembly	300,000
Seeker assembly	550,000
Vertical PWB	700,000
Plastic IC	200,000
Wave solder EP	65,000
Analog to commercial IC's	250,000
Ceramic D-ring coating	16,000
Machine set up	200,000
Machine down time	158,000
Warhead body	37,000
EP housing	10,000
Control housing lock ring	7,000
Nonconforming material	80,000
Aft closure	25,000
Fuze redesign	800,000
Container redesign (maxi)	600,000
Total	16,051,000

Lieutenant Colonel HENNIGH. We also want to provide additional sourcing for pyrotechnics and electronic components.

We also want to provide money to the contractor so that he can go out and compete on certain items such as a control actuator which is a major component of the bird.

Also we want to develop a cheaper roll rate sensor because the present one is very expensive.

Senator LEVIN. So we are investing in competition?

General PIHL. At the major subcomponent level, sir.

Senator LEVIN. Why is it they weren't competed before now?

General PIHL. Lack of money, sir.

Senator LEVIN. They are going to cost us money to save us money?

Lieutenant Colonel HENNIGH. To incur initial development cost. The net savings on the control actuator, after a cost of $3.7 million to

develop another source translates into savings of, say, $20 million to $30 million.

Senator LEVIN. For the record, would you please tell us what additional components you are going to get the additional sources for, and what the cost of investment is for each of those components and what the expected savings is over what period of time?

General PIHL. We certainly will, sir.

[The information follows:]

SECOND SOURCE COMPONENTS

The following chart provides those items used in Copperhead that have been identified for additional sourcing, their costs, and anticipated savings.

	Period of savings	Investment cost (thousands)	Net savings after cost (millions)
Component:			
Pyrotechnic devices (4 items)	Fiscal year 1984 through fiscal year 1989	$121	$2.2 –$3.5
Electronic components (66 items)	do	700	.83 –1.65
Fuze	Fiscal year 1987 through fiscal year 1989	2,868	4.025
Roll rate sensor	Fiscal year 1986 through fiscal year 1989	2,757	5.4 – 6.7
Control actuator	do	3,679	4.4 – 8.6
Total		10,125	16.86–24.48

Senator LEVIN. Thank you.

Senator HUMPHREY. Continuing on Copperhead, General Pihl, how are we doing with regard to the cost since the threshold was broken and steps were taken? What steps were taken to get it under control and how are we doing?

General PIHL. The first step is a firm fixed-price contract.

Senator HUMPHREY. Where does that stand?

General PIHL. That stands now that we can reduce the cost from the $54,000 level to $50,000 under firm fixed-price contracting.

Senator HUMPHREY. Is that a pretty firm agreement now? Is that going to be signed sometime soon?

General PIHL. That is a firm agreement, but I have to say to you where Copperhead stands and these are perhaps facts you know, but, if I may for the record, we have put $6 million into the fiscal year 1982 budget in order to stretch out the procurement program to keep the Copperhead program funded so that there is still a warm production base.

We then took the $15 million that was set aside for layaway Copperhead at the time it was terminated and sent a reprograming request to the Hill to convert that into long-lead items so that we could get the program going again.

Subsequent to that it was determined that a better way to go would be to actually fully fund Copperhead in the fiscal year 1983 timeframe, so we submitted a second reprogram or replacement reprograming for $55 million for 1,100 rounds.

It is very key that we get that $55 million reprograming to bridge the gap between the fiscal year 1982 funded delivery period and the fiscal year 1984 budget where we have been authorized $75 million for the 1984 budget to make these kinds of cost stories come true.

At this point in time we do not have the fiscal year 1983 reprograming to buy those 1,100 rounds. We face a potential break in the production line between fiscal year 1982 and fiscal year 1984. The cost story would then be quite different obviously.

Senator HUMPHREY. So, the first step was to engage in a fixed-price contract?

General PIHL. Yes, sir.

Senator HUMPHREY. When is that going to happen?

Lieutenant Colonel HENNIGH. We anticipate with the appropriation we will have a firm fixed-price agreement by December. With the concurrence on the fiscal year 1983 reprograming we are prepared to negotiate and come to an agreement by next month. That also will be a firm fixed price.

Senator HUMPHREY. Were there other recommendations as a result of the cost overrun?

General PIHL. In terms of lowering the cost as a result of cost overrun?

Senator HUMPHREY. Yes; what happens when you cross this 15-percent threshold? What does that do to whom?

General PIHL. In terms of the number 30, sir?

Senator HUMPHREY. Yes.

General PIHL. The first thing we have to do is to certify and I think that process is well known.

In terms of the individual responsibility for the breach and what the command does, should we have a cost capability to send a team out to find out what that cost would be in terms of evaluation? That was done in this case.

We had a cost risk review team that went to Martin-Marietta to take a look at this. Some of the very best cost analysts we had participated, including one of my colleagues, working directly with General Merryman, DCSRDA.

I guess without appearing to be talking in the vernacular, the heat kind of gets turned onto the system. That is why the Government review team went down to take a look at the proposition I discussed earlier, the $21 million investment to lower the basic cost of Copperhead.

Senator HUMPHREY. In this case the process was to establish some figure to get the contractor to agree to that?

General PIHL. Yes, sir.

Senator HUMPHREY. That results in a fixed-price contract. Is that a rough approximation?

General PIHL. Yes; that is where we are headed. The key to that is that we have a continuum in the program, that we get the fiscal year 1983 money to keep the program funded.

Senator HUMPHREY. Given the large requirement, what about second sourcing, either the system or subcomponents?

General PIHL. We will supply for the record, as we discussed with Senator Levin, what the breakout is for the second subcomponents.

In terms of a total second source at the 30,462 quantity we do not see a second source for Copperhead as being economical at this time.

I might add, Senator, that is an issue being debated right now by the Defense Resources Board. As we go from POM to budget, that will be looked at.

Senator HUMPHREY. If the quantities are too small, what about accelerating this program?

At the end of the 5-year program you are only going to have how many days? Is that classified?

General PIHL. Yes; I will be happy to answer that question in closed session.

Senator HUMPHREY. Fine, we will get into that specifically later. My point is since we are going to be short of the defense guidance, have you considered increasing the quantities? That would make it more attractive presumably for second sourcing.

What about that angle?

General PIHL. Sir, the Defense Resources Board, DRB, in their deliberations have that as one of the major issues.

As we go from PCM to budget in what is now called the program budget decision process, it is my expectation that the DRB will once again deliberate that between now and the time the President's budget is finally submitted.

The second source as an issue is still being actively debated within the building.

Senator HUMPHREY. Can you compare the advantages of second sourcing on this system to multiyear? Are you in a position to do that?

General PIHL. Not at this time, sir, because I think in all candor one of the conditions for multiyear sourcing is a stabilized program. It is very difficult for me to project a multiyear stability given the current proposition of Copperhead where it stands right now as far as the 3 years are concerned.

AMMUNITION ACCOUNT ADEQUACY

Senator HUMPHREY. I would like to discuss now the overall adequacy or the adequacy of the overall ammunition account.

According to your testimony on page 1, the fiscal year 1982 appropriation was $2.3 billion; fiscal year 1983 was $2.1 and a more current figure than you have used as a result of passage of the conference report for fiscal year 1984 is $2.147.

You make the point that in fiscal year 1983 you have been seriously curtailed in the training of troops because of practice ammunition, I guess.

The fiscal year 1984 authorization so far in the process is about at the same level, in fact, in constant dollars, I suppose would be even less than fiscal year 1983.

Do you agree with that analysis so far or did I get ahead of you?

General PIHL. You did not get ahead of me. Not less than 1983, but close.

Senator HUMPHREY. No better?

General PIHL. No better certainly.

Senator HUMPHREY. Then you still have the same problem except now the backlog in training, so to speak, is going to grow? Instead of having 1 year of insufficient training, we will have 2 years in a row.

Is that a fair assessment from these figures?

General PIHL. Yes, sir; in terms of our training ammunition shortage, that is correct.

Senator HUMPHREY. How serious is that? Can you quantify that in some way?

General PIHL. Right now in fiscal year 1984 we believe we are short $140 million as far as our key training items are concerned.

A list of munitions that starts from cartridge, 5.56 mm, caliber 45, 105 mm DS–TP, 40 mm TP.T, 105 mm TP.T, 4.2 inch HE, caliber .50, 30 mm, 20 mm, and a series of simulators and demolition and smoke fire pyrotechnics we use in our two-sided maneuver.

In terms of the standards in training commission in which we compute our training requirements, we are now centralizing within the Army or training requirements process in that a tank battalion is a tank battalion, so, therefore, rather than having a bottom-up approach to ammunition computations where the field sends in its ammunition need for training and we aggregate those at the Department of the Army, we have standardized that process and we are going to take a top-down approach to that to where we tell the field what their allocation is going to be.

So, in terms of how serious it may have been portrayed on a bottoms-up training computation basis, I think in terms of having standardized training for our units throughout the world, first of all, we are going to reduce the amount of training ammunition that is required and constrain it so that all the units with the same readiness level will have the same amount.

We think we have that number down now to where we are about $140 million short of our needs in fiscal year 1984.

Senator HUMPHREY. You are 140 short. Again your figure on page 1 at the bottom is training ammunition 543. So you feel you need about 680? Is that about right?

General PIHL. Yes, sir, that would be correct.

Senator HUMPHREY. 140 is about a 20-percent shortfall in dollars?

General PIHL. Yes.

Senator HUMPHREY. How does this translate into lost training for a typical tank crew, for instance, that 20-percent dollar shortfall?

General PIHL. Sir, in terms of the way in which the units would train, if you want me to say how many crews wouldn't get trained, I would have to supply that for the record.

[The information follows:]

General PIHL. The majority of forward deployed and early deploying Army tank crews require 134 main gun rounds each to train to an annual readiness standard. These tank crews include all forward deployed crews and 6 divisions of CONUS-based forces. A 20-percent reduction will cause the availability of tank ammunition to fall to 108 rounds per year per tank crew. This reduction is below the minimum number of rounds required to attain and sustain weapons proficiency and will affect the combat ready status of tank crews Army-wide.

Senator HUMPHREY. How many rounds they couldn't fire that you think they should fire.

Do you have that?

General PIHL. Yes, sir. Right now a level that would train for a year as far as a tank crew, they fire 134 rounds per year. A reduction in the tank ammunition by 20 percent would cut them down to 100 rounds a year.

There are certainly ways to get at that in terms of the kind of training shortages you would have to do. In terms of maintaining our readi-

ness, if that is your question, that amount of reduced training ammunition, of course, reduces the readiness of our lower priority units in terms of their time in which they would be called upon to fight.

What I am really suggesting, sir, is that we could catch up in the lower priority units if we had to.

Senator HUMPHREY. That is very disturbing, especially since we will apparently make no progress in fiscal year 1984 versus fiscal year 1983.

That brings up the question again and I know these things are always trade-offs, but it brings up the question, aren't we funding Copperhead at the expense of reduced training and reduced growth in war reserves?

General PIHL. Sir, the Copperhead program in terms of how that $1.6 billion got restored when the Select Committee of the Army, which is essentially our council of lieutenant generals, principal deputies to the Chief of Staff and the Secretary, was really competed against the major weapons system of the Army, treated as a weapon system as opposed to an ammunition.

It was brought in at the top line of TOA. No one sat down in the room on the ammunition budget and said, how many ammo items are you prepared to give up for Copperhead?

We have been trying to explain that process now to those who have asked us that question. It gets a little difficult with the number of trades you got made because you have to balance out the entire Army budget to see what came in and what came out in order to do that.

I would not want to leave this committee with the impression we went in and zeroed some within the ammunition because we did not.

It is our hope to buy the supply that the defense guidance has given us. As we compete ammunition against the other priorities within the Army, we hope to redress the training imbalance.

Senator HUMPHREY. Senator Levin?

Senator LEVIN. On the training ammunition question, can you give us the figures, the new requirement figure?

General PIHL. The quantities that come from the STRAC, sir?

Senator LEVIN. You had some old requirement figures on the chart you gave us for training and for fiscal year 1984 it was $1.8 billion.

For fiscal year 1985 it was $2 billion.

For fiscal year 1986, $2.3 billion.

I am rounding it off. Apparently you have changed your requirement for training ammunition.

Can you give us those new figures in billions?

Mr. BYRON. Yes, sir. The new figure is based on going to the new training concept. Starting in fiscal year 1984 the requirement would be $1.2 billion.

In fiscal year 1985, $1.3 billion.

Fiscal year 1986, $1.3 billion.

Fiscal year 1987, $1.7 billion.

In fiscal year 1988, $2.1 billion.

Senator LEVIN. Is that the Army decision to change the requirement?

Mr. BYRON. The requirement was changed, sir, going from the old Training Ammunition Authorization Committee (TRAC) concept, to the new Standard and Training Commission (STRAC) concept.

General PIHL. The answer is yes.

Senator LEVIN. Is this a budget constraint or is this a military decision based on what you need militarily?

General PIHL. Some of both. What I tried to suggest is what we are trying to do, having come from the field most recently, we are trying to standardize the way in which training ammunition is computed so that every battalion in the field is not computing its own rates of ammo based on its local training area or major training area.

So, what the Standards and Training Commission, (STRAC), tried to do was to standardize the program so that the computations could be made at the Department of the Army level and allocations could be made at our level which I guess in shorthand would kind of suppress some of those who would like to fire more rounds than we were prepared to provide them.

Senator LEVIN. What will be the budget request in fiscal year 1984? What was the amount authorized in fiscal year 1984 for training ammunition offhand?

Mr. BYRON. The requirement——

Senator LEVIN. Is $1.2 billion.

Mr. BYRON. The authorization was $936 million.

Senator LEVIN. What was it in fiscal year 1983?

Mr. BYRON. The authorization was $777 million.

Senator LEVIN. Do you know what the 5-year plan is for authorization, what you expect to ask for in fiscal year 1985?

Mr. BYRON. No, sir, we don't know at this time. The DCSOPS training community right now is developing the fiscal year 1985 authorization which will be allocated to the forces in the field.

Senator LEVIN. Do you expect that your training ammunition request for fiscal year 1985 will be at least as much as the fiscal year 1984 authorization?

Mr. BYRON. Sir, it will be practically the same number.

Senator LEVIN. You expect it will be the same number?

General PIHL. At least as much, yes, sir.

Senator LEVIN. You can't give me that figure in the budget you have just submitted to the Office of the Secretary?

General PIHL. In terms of our POM.

Senator LEVIN. Can you give us the number that appears in your request to the OSD?

Mr. BYRON. The funding currently in our budget for fiscal year 1985 for training is $807 million, sir.

Senator LEVIN. Is that in your budget request?

Mr. BYRON. Yes, sir.

Senator LEVIN. Do you expect that will go up to the 936, at least to 936?

Mr. BYRON. No, sir.

Senator LEVIN. I missed something.

Mr. BYRON. The $936 million figure we were talking about previously was the fiscal year 1984 authorization requirement in the fiscal year 1985 budget you have before you.

My revised funded program in the current fiscal year 1985 budget is $807.6 million.

Senator LEVIN. I asked what was the actual amount we authorized in fiscal year 1984. Do you have that figure?

Mr. BYRON. The number I gave you, sir, was the actual number.

Senaeor LEVIN. So that we actually authorized $936 million for training ammunition in fiscal year 1984 and you have now asked the OSD for $807 million for fiscal year 1985.

Mr. BYRON. For fiscal year 1985, sir.

General PIHL. Yes, recognizing, sir, that that is the position where the program objective memorandum got located and that is the starting point for what is now the next part of the process.

Senator LEVIN. I don't understand why you would ask less for training ammunition next year than we authorized for this year, this year being fiscal year 1984?

General PIHL. I guess the difficulty, Senator, is who "we" is.

Senator LEVIN. Why would the Army ask less for training ammunition than Congress authorized for you for fiscal year 1984 in your fiscal year 1985 budget request.

Mr. BYRON. Let me clarify one thing.

You asked me about the authorization. That was the authorization requirement. We have 100-percent requirement. Something less than that is authorized.

When you asked me for the authorization, I gave you the reduced requirement that is placed out in the field. That is not the funding we got in fiscal year 1984.

Senator LEVIN. Can you give me the funding level you get in your fiscal year 1984 authorization bill?

Mr. BYRON. Yes, sir. In the budget estimate that we sent over here——

Senator LEVIN. No, the bill that was passed.

Mr. BYRON. We requested $543 million. However, in the authorization conference we did get a plus-up for training for selected items along with a reduction for several items.

Senator LEVIN. Can you give a figure for Army training ammunition that appears in the authorization bill for the Congress for fiscal year 1984?

Mr. BYRON. $538.0 million, sir.

Senator LEVIN. That is the figure which you compared to the $807 million you asked OSD for for 1985?

Mr. BYRON. Yes, sir.

Senator LEVIN. Is that a comparable figure so that we know you are asking for at least as much?

Mr. BYRON. Yes, sir.

Senator LEVIN. That is all I have on the training ammunition.

ARMY AMMUNITION PLANTS

I wonder if I could get another series of questions?

This question has to do with the Army ammunition plants. My staff has been working, I gather, with your staff in the last few weeks to try to understand these plants.

We have 25 Government-owned contract-operated ammunition facilities. Twenty of them are operated under cost-plus contracts for reasons we don't understand.

Can you explain why 20 of your plants, munitions plants, are operated under cost-plus contracts?

General PIHL. Yes, sir, I can.

First of all, we do have our active plants on a cost-plus incentive contract basis because of the unusual risks in handling, storing, and shipping and receiving explosives and explosive components, the high dollar value of the cost base, the complexity of the projects for modernization and expansion, the need to prove out the line, safety, and security and some concerns for energy.

I went a little deeper into that in terms of the determination of findings that the Secretary has approved as to how we cost these particular plants.

It is not economically or administratively feasible to separate one type of work from another type of work done by a GOCO contract at each installation.

When you hire electricians or plumbers who work on production facilities in GOCO they also perform that type of work for the other parts of the facility such as the housing, the administrative buildings, and so forth.

So, when we hire a services contract to run our GOCO they run the entire facility, not just the plant for ammo. Because of the uncertainties in there, we do that on a cost-plus basis.

Senator LEVIN. You have some fixed fees, you have cost-plus fixed fee, you have cost-plus incentive fee, both on active plants.

Why would you not have incentive fees on all of them?

General PIHL. Sir, that is our goal to get to a position where we are in a cost-plus incentive fee rather than fixed fee. That would be our trend line.

I can supply for the record those we do not have.

Senator LEVIN. Why would you not have them on your active plant? Why would you have fixed fee?

Even if I accept all your reasons which you just gave for why you would want a cost-plus to begin with, why would you want a cost-plus fixed fee on those plants?

General PIHL. Sir, I answered you before in another hearing in another committee. Of course, we are trying to get away from that cost-plus fixed fee.

Senator LEVIN. You are doing it because you are trying to get away from it?

General PIHL. We are trying to get away from the cost-plus fixed fee contract.

Senator LEVIN. Why do you have those things floating around here is my question?

I know you are trying to get away from it. Why haven't you succeeded?

General PIHL. I don't have a good answer for today. May I supply that for the record.

Senator LEVIN. Sure.

[The information follows:]

COST PLUS FIXED FEE CONTRACTS

General PIHL. There are several reasons. The most prominent reason in the inactive base is the prohibitive cost of indemnification for handling, storing and shipping of toxic, hazardous materials, explosives, propellents and loaded ammunition. Because of the risks involved in this nature of work, "cost plus" type

contracts are used. When safety and security for handling and storing these sensitive items is coupled with the need for strict adherence to procedures for protection and safety of Government equipment, facilities, property, and people, there are few areas left to incentivize. Currently, the area of utility costs is being studied for incentivizing. The Engineering Directorate, Headquarters US Army Armament, Munitions and Chemical Command (AMCCOM), Rock Island, Illinois, is collecting data covering a five-year period of utility costs at Government Owned, Contractor Operated (GOCO) plants. Analysis of this data is to result in a basis to negotiate incentives into contracts to reduce energy costs. This study is scheduled for completion in March 1984.

The active ammunition production base has more flexibility for incentives but has the same problems with indemnification for production, handling and storage of explosives, toxic material and loaded ammunition. Currently, two contracts for active production lack incentives. The Lake City contract will be completed when terminated. The Holston contract has been identified for negotiation of utility incentives; however, other areas at Holston are not beneficial for incentives because of the potential for windfall profits.

Senator LEVIN. Now let us go back to the question of cost-plus on inactive plants.

Why would you need a cost-plus contract at all on inactive plants even if we can accept your explanation on active?

General PIHL. Low dollar value of the cost base, sir, small Government staff, the consistency I think in terms of the dollars that go because these contracts for inactive plants have been reasonably well managed.

In other words, there have not been overruns.

Senator LEVIN. On some you have fixed prices and on some you have cost-plus?

General PIHL. Yes, sir.

Senator LEVIN. If you have fixed prices on some active plants, why not on others?

General PIHL. Out fixed-price contracts I think you will find are mostly in the metal parts arena. So, there is some consistency with the input into the type of contract.

Senator LEVIN. You are saying there is a pattern, some types of inactive plants have fixed-price contracts and other types of inactive plants have cost-plus contracts. Is that what you are saying?

General PIHL. Yes.

Senator LEVIN. Describe the differences again.

General PIHL. I think in a cost-plus fixed fee arena or a cost-plus contract for an inactive plant where you have cost stability the cost-plus contract does not present us a particular problem because we are managing the contract within the costs that are in the contract.

Senator LEVIN. Why not try to have fixed price? I don't see why you don't move to that? I am trying to figure out why and I don't understand your answer.

That you have been able to manage it doesn't mean you couldn't do better.

General PIHL. Sir, we can do better.

Senator LEVIN. Would you tell us for the record, give us the length of the contract in each plant, whether or not it is your intention to move to fixed-price contracts on all inactive plants? You have fixed-price contracts on some active plants?

General PIHL. Yes, sir. We also have fixed-price contracts for some ammo we buy that is not even within our Government plants where we actually buy from industry obviously.

Senator LEVIN. Once you get fixed price on some active plants and fixed price on inactive plants, the question is why can't you have fixed price on all your active and inactive plants?

General PIHL. I understand.

Senator LEVIN. I don't understand your explanation. Could you go through it plant by plant for us in the record, your intention in each plant as the contract runs out as to whether or not you are going to go fixed price?

If you are not going to go fixed price on renewals, tell us why, active and inactive, plant by plant.

General PIHL. I will do that, sir.

[The information follows:]

FIXED PRICE CONTRACT BY PLANT

General PIHL. The major reasons for not having fixed price contracts for all active and inactive plants are as follows:

a. Prohibitive or nonavailability of costs for indemnification for handling, loading, storing and shipping of toxic materials and explosives, especially for coverage of inventory and product liability. However, there are fixed price contracts for metal parts production facilities and inactive plants that do not handle hazardous materials.

b. Unstable workloads, uncertainties that cannot be reduced, and schedule changes for FMS and other customers.

c. Need to enforce strict security and safety procedures because of the nature of materials (hazardous, explosive, sensitive) produced and stored and the physical plant itself (e.g., unauthorized access, sabotage, espionage).

d. Need for quick response capability to meet urgent and frequent widely fluctuating demands from customers and worldwide situations.

NOTE.—A detailed plant by plant breakout of contract information was provided separately through the Office of Congressional Legislative Liaison to the SASC on October 21, 1983.

General PIHL. One thing I will clarify for you.

The one fixed price we have for an active plant is Scranton. That is a metal parts producer, so you would have uniformity of flow into that and you can contract for that on a fixed-price basis.

The real answer in the cost-plus arena is the perturbations that occur in the funding and workloading of some of these plants. Therefore, the risks that would be borne by the contract operator as we are changing the amount of money upon which he can base his workload is why they are in the cost-plus arena.

Senator LEVIN. What about River Bank?

General PIHL. River Bank?

Senator LEVIN. Isn't that a fixed price in an active plant?

Colonel HUDAK. That is also a metal parts plant.

General PIHL. Yes, sir, that is also a metal parts producer.

Senator HUMPHREY. Continuing the line of questions begun by Senator Levin, has there been any study in recent years about the rationality of this whole ammunition production procurement process?

I visited one ammunition production facility and if it was representative, it looked like a rather inefficient process; old buildings, old machinery scattered all over the place.

Has there been such an overall study about the rationality of the way we are going about this business?

General PIHL. Yes, sir, I believe there has. I have with me someone who can tell the history of where the plants have come from World War II to the present time.

Senator HUMPHREY. It looks like some of them just grew.

General PIHL. Yes, that is true.

Senator HUMPHREY. What about consolidation? Has anybody studied that? Wouldn't we do better if we consolidated some of these facilities? Any attempt to close them down?

General PIHL. Yes, sir. There have been attempts in the past to both close plants and consolidate.

Of course, as you know, we are the single manager for conventional ammunition. Our executive director for conventional ammunition is at Darcom. Both Lieutenant General Babers, his executive, Major General Burbules, and I have discussed this very actively.

We have looked previously at Scranton. We have looked previously at Louisiana and we have looked previously at Kansas as far as closures are concerned in terms of economies and efficiencies.

Previous attempts to do that were overturned as we came forward through the Congress. We are, as you know, about ready to open up the Mississippi ammunition plant to build the 155 ICM. When that modern ammunition plant comes on line there is an opportunity to close 2 or 3 of our 12 active plants and achieve some economies.

Senator HUMPHREY. Did you say there has been some recent studies about this whole subject?

General PIHL. I believe, as I have read the authorization conference language, we owe you a study by the end of February on this entire subject and that study has been tasked to Darcom that looks at the ammunition base.

Senator HUMPHREY. That will include a study of the efficiencies and inefficiencies of the way we are doing things now and recommendations how to improve the situation?

General PIHL. Yes, sir.

Senator HUMPHREY. The Army has attempted to make some such changes, but has been thwarted by parochial interests, is that it? It has not been blocked by you? It has been blocked by Congress?

OVERALL AMMUNITION BUDGET

Going back again to the overall ammunition budget. the fiscal year 1985 request apparently is going to be substantially smaller than projected in March; is that correct?

General PIHL. It could be, sir, is a fair answer to that question. I am not at liberty, of course, to project where we are as far as our POM to budget is concerned.

It is our intent in the next round as far as our dealings with the Office of the Secretary of Defense is concerned to see if we cannot achieve the fiscal year 1985 column of the fiscal year 1984 budget as far as our projection is concerned.

As far as the current process is concerned, ammunition did not compete as well as we would have liked it to have.

Senator HUMPHREY. At what level does that problem occur, that decision occur, where it does not come out quite the way you wish?

General PIHL. It occurs at two levels. One within the Army when we balance out our accounts in terms of the ratio of modernization and other accounts and then when it gets up to the Secretary of Defense and is debated by the Defense Resources Board.

Senator HUMPHREY. Within the Army at what level is the pie cut up?

General PIHL. Our select committee, sir, is the final approval authority as far as the budget is concerned. The Vice Chief of Staff of the U.S. Army is the chairman of that committee. All of those decisions are ruled upon by the Secretariat, Mr. Marsh and Mr. Ambrose and General Wickham and General Thurman before it goes forward to OSD.

Senator HUMPHREY. The way things are shaping up then, over the 5-year defense plan we are going to probably lose about a whole year of procurement. Is that about right?

General PIHL. A year of procurement based on the 5 years if we do not sustain the growth that is shown in the fiscal year 1985 column of the fiscal year 1984 budget?

Senator HUMPHREY. That is correct.

General PIHL. That would be the outcome.

Senator HUMPHREY. With that knowledge and knowing that you will have to meet certain sustainability objectives, stockpile objectives, then things go pretty poorly for training all the way through the defense plan.

Is that a correct analysis?

General PIHL. I am not certain that the training budget would be in an analog with the war reserve budget. I don't want to imply to you there is some ratio where training gets cut in direct proportion to that amount that is not funded in ammo.

I say that because there is a training office that debates the training requirements for the Army and they could change the balance between training ammunition and war reserve ammunition obviously.

Senator HUMPHREY. Are you not required to meet the sustainability requirement at the end of the 5-year plan?

General PIHL. Yes, sir, we have defense guidance to do that.

Senator HUMPHREY. Given the shortfalls that are shaping up overall, there is only one area out of which you can make up the difference if you are to meet your guidance and that is training? Isn't that a correct analysis?

General PIHL. Or other accounts, sir.

Senator HUMPHREY. Such as what?

General PIHL. Weapon systems, other procurement, Army. We have six accounts within my agency.

Senator HUMEHREY. Is that addressed in your testimony?

General PIHL. No, it is not, sir.

Senator HUMPHREY. What are those accounts?

General PIHL. Weapons and tracked combat vehicles, missiles, aircraft, other procurement, Army, one, two, and three, and procurement of ammunition, Army.

Senator HUMPHREY. Are you suggesting then that you are going to be able to make up the difference out of one of these other five accounts?

General PIHL. No, sir, I am not suggesting that. I am saying in the process of the debate that will occur as we redress the ammunition accounts within our investment accounts balance, that is the competition that will occur in the Defense Resources Board between now and the time the budget comes to you in January.

Senator HUMPHREY. Traditionally, apparently, we have devoted a third of our ammunition resources to training.

Do you agree with that?

General PIHL. Yes.

Senator HUMPHREY. What would that figure be in 1984? Let us make it fiscal year 1983. That is the most recently appropriated.

What is that ratio? Do you have that handy?

General PIHL. Yes, we do, sir.

Mr. BYRON. Sir, if I could address the fiscal year 1984 budget breakout between war and reserve and training.

Senator HUMPHREY. You don't have it for fiscal year 1983?

Mr. BYRON. Not here with me. I can provide it. I can address it for fiscal year 1984.

[The information follows:]

FISCAL YEAR 1984 WAR RESERVE/TRAINING AMMO BREAKOUT

Mr. BYRON. The fiscal year 1983 war reserve funding was $1,065.4 million. The training ammunition funding for that fiscal year was $652.1 million. The ratio of war reserve to training was therefore 1.63 to 1.

Out of the total budget submitted in fiscal year 1984, $1,471 million is in support of war reserve and $543.9 million is in support of training.

Senator HUMPHREY. That is your submission. Do you have that ratio for the fiscal year 1984 authorization?

Mr. BYRON. I don't have it with me, sir.

Senator HUMPHREY. Is it about the same as far as you know?

Mr. BYRON. Yes, sir. Out of the total TOA in the Army hardware account, approximately 30 percent has been allocated to training in fiscal year 1984. The balance has gone to war reserve.

Senator HUMPHREY. Thirty percent is the rule of thumb.

Is that going to be adhered to? Do you project you will be able to adhere to that ratio for ammunition training support through the 5-year defense plan?

General PIHL. To the best of our ability, we will, sir, with only one exception. That is as we take a look at our standards of training, we do have to take a look at what the impact of substitution and simulation is over that period of time.

There may be some opportunities to reduce the amount of training ammunition through substitution and simulation.

Senator HUMPHREY. You say to the best of your ability. That doesn't clarify too much for me.

How realistic do you think it is to expect that the Army will be able to maintain that historical ratio? Do you think it is likely or unlikely?

General PIHL. Likely.

Senator HUMPHREY. I don't see how you are going to do that. I hope you do and I wish you well, but I don't see how you can, given the shortfalls in the overall ammunition.

If you are going to meet the requirement of the 5-year defense plan for stockpile, for sustainability, then I don't see how you are going to maintain that relationship for training support.

General PIHL. If I may, sir, I think perhaps the way for me to best clarify this is we are no longer using ammunition as a balancing account, as a bill payer, if I may say that in those terms.

Ammunition is being translated in the Department into readiness. I know that is the concern of this committee.

When I say to the best of my ability, when I go to the table to bargain in terms of how we balance our accounts, we are able to make a case for the need for training ammunition based on our understanding of those training requirements and we are able to make a case for our war reserves as we fill out the amount that is due for the defense guidance.

When I say my ability, I mean personally as the director in charge of the ammunition, I think I have both the rationale and the interest of the field to make sure that we sustain the accounts at that rate.

Only some unknown factor such as a cut in our TOA that I can't project right now would cause that to change. That is what I meant by saying to the best of my ability.

Senator HUMPHREY. General Pihl, Lieutenant Colonel Hennigh, Colonel Hudak, Mr. Byron, thank you very much.

General PIHL. Thank you, sir.

[The following questions submitted by Senator Carl Levin of the Armed Services Subcommittee on Preparedness to be answered for the hearing record:]

QUESTIONS SUBMITTED BY SENATOR CARL LEVIN

CONTRACTS AT ARMY AMMUNITION PLANTS

Senator LEVIN. General Pihl, your staff has provided us with a list of the types of contracts at all 25 Government-owned, contractor-operated (GOCO) Army ammunition facilities, which shows that 20 are operated under cost-plus contracts and only five are operated under firm fixed-price contracts.

Cost-plus contracts are generally reserved for level-of-effort or high-risk programs, particularly in the R&D world.

Most of the ammunition produced at these plants comes off production lines that have been in operation for several years. There is little technical risk involved as would be the case in the production of a brand new product which advances as the state of the art.

Why are there so many cost-plus contracts and so few firm fixed-price contracts at the Army ammunition plants

General PIHL. The risk involved in handling volatile, hazardous materials, costs for indemnification, technological changes, schedule changes because of foreign military sales, other customers, and the international arena tensions lead to cost type contracts in lieu of fixed price. The fixed price contracts are for the metal parts which have fairly stable designs and firm schedules and in those cases where there are no hazardous materials.

FIRM FIXED PRICE VERSUS COST PLUS

Senator LEVIN. Wouldn't there be more incentive for a contractor to operate efficiently under a firm fixed-price or fixed-price incentive contract than under a cost-plus contract?

General PIHL. Economic theory leads us to believe this would be economically efficient provided that risks can be reduced or removed and uncertainties in workload, technology, funding and the world situation become known. However, in the ammunition base the risks involved in storing and shipping hazardous toxic or explosive materials and uncertainties which may result from unauthorized access/sabotage/espionage of the physical plant (particularly highly sensitive and secure areas) make it difficult, at best, to estimate an efficient cost. As a result, a judicious trade-off between efficiency of cost and effectiveness of the desired result is made. To provide cost effectiveness and control costs numerous control mechanisms are implemented. Among these mechanisms are the following:

a. Uniform Cost Accounting and Reporting system assures correct reporting of costs incurred against negotiated results, as well as comparison of costs between like plants.

b. Annual Should Cost Studies with reviews by US Army Armament, Munitions and Chemical Command (AMCCOM) and US Army Materiel Development and Readiness Command (DARCOM) Business Clearance Review Boards before initiation of negotiations.

c. Resident DCAA auditors.

d. Industrial Management Reviews performed annually.

e. Inspector General reports and inspections annually.

f. Yearly workloading decisions which reduce work for inefficient plants and close down production lines if not cost effective.

g. Compensation, wages, salaries, and exempt employee salary levels are all reviewed, compared with other plants and approved at certain reimbursable levels.

h. Advance agreements on Home Office General and Administrative Expense reimbursability.

i. Contractor Procurement System Reviews.

j. Third Party Contracting to reduce overhead.

k. Facility Contracts with other DOD firms which offset costs.

l. Intra-Agency Support Agreement which offset costs.

m. Competitive site selections between plants before assignment of new items.

n. Formal source selection procedure for competitive actions. (Lake City AAP and Johnston Island will be completed in fiscal year 1984.)

CONTRACT COMPETITION

Senator LEVIN. How often are the contracts for these facilities competed?

How often does the competition result in one contractor actually replacing another?

General PIHL. Contracts normally are negotiated for a 5-year period and subjected to competition, at renewal, only for cause (e.g., impasse in negotiation, poor past performance, adversary relationships, bankruptcy, conflict of interest or contractor desire to terminate).

There have been ten competitive procurements since 1970. Nine of these have resulted in change of contractor (Holston AAP was the only exception).

INACTIVE AMMUNITION FACILITIES

Senator LEVIN. Why are inactive ammunition facilities operated under cost-plus contracts instead of firm fixed-price contracts?

General PIHL. The primary reasons are:

a. Nonavailability/Prohibitive Cost of Indemnification.

b. Adherence to established procedures for storage, safety, security and handling of loaded ammunition and toxic and hazardous materials and security of physical plant.

c. Frequent change/reduction to annual funding which changes the scope of work to be performed.

FISCAL YEAR 1985 BUDGET REQUEST

Senator LEVIN. General Pihl, earlier this year when the Army presented its fiscal year 1984 authorization request of $2.3 billion for ammunition, you estimated the fiscal year 1985 ammunition program would be $3.4 billion.

I understand you have just submitted your fiscal year 1985 ammunition budget to OSD and OMB.

How does the $3.4 billion you said earlier this year you would be asking for in fiscal year 1985 compare to what you have now actually requested in your fiscal year 1985 budget?

General PIHL. I am unable to discuss the fiscal year 1985 budget. Paragraph 3, OMB Circular A–10, Responsibilities for Disclosure with Respect to the Budget, precludes disclosure of budgetary material prior to transmittal of that budget by the President.

PROGRAM REDUCTION

Senator LEVIN. What specific programs have been affected by the $500 million (15 percent) reduction in fiscal year 1985 funds from the level you were projecting only five months ago?

General PIHL. I am unable to discuss the fiscal year 1985 budget. Paragraph 3, OMB Circular A–10, Responsibilities for Disclosure with Respect to the Budget,

precludes disclosure of budgetary material prior to transmittal of that budget by the President.

DAYS OF SUPPLY OBJECTIVE

Senator LEVIN. Back in April you presented the subcommittee a schedule showing that we would reach our near-term objective in days of supply of standard and modernized munitions by the end of the fiscal year 1985 funded delivery period.

What impact will the reductions to the fiscal year 1985 budget have on meeting the days of supply objective by the end of the fiscal year 1988 funded delivery period?

When will we now meet this objective?

General PIHL. I am unable to discuss the fiscal year 1985 budget. Paragraph 3, OMB Circular A–10, Responsibilities for Disclosure with Respect to the Budget, precludes disclosure of budgetary material prior to transmittal of that budget by the President.

DAYS OF SUPPLY PROGRESS

Senator LEVIN. If the days of supply objective is so critical, why aren't we making more progress toward achieving it?

General PIHL. We consider building our war reserve days of supply as one of our most important objectives. However, there is a shortfall in funding throughout all Army accounts that prevents faster acceleration in achieving this objective. Within the limited resources that are provided to the Army funds must be allocated to all accounts to achieve a balanced force. We feel that within current funding constraints, we have a balanced force.

AMMO PRODUCTION BASE

Senator LEVIN. General Pihl, a recent GAO report regarding the Army's ammunition production base concluded that "Although the U.S. production base has a tremendous capability and can generally produce the planned peacetime procurements of ammunition, it lacks the capability to produce a large part of the projected mobilization requirements for many newer, more sophisticated ammunition items." General Pihl, in your opinion how ready are we to fight a conventional war in Europe next week, with the current ammunition inventory and the current mobilization production capability?

General PIHL. Our current inventory provides us with a [deleted] day fighting capability for a conventional war in Europe. Our mobilization capability would not significantly increase the amount of additional ammunition available to Europe until the ninth month after D-Day.

155 M483 ICM

Senator LEVIN. One of the munitions highlighted in the GAO report is the 155 M483 Improved Conventional Munition (ICM). Although the monthly mobilization requirement for the M483 is 643,000 rounds, production would be limited to about 44,000 rounds a month unless the Army increases its production capacity for the explosive RDX/HMX. If we went to war, how would we make up for this shortfall in the production capacity for this important munition?

General PIHL. The Army is planning to increase its current capability and to stockpile RDX/HMX based explosives.

RDX/HMX

Senator LEVIN. How long would it take to build and design a facility to produce RDX/HMX? Are funds for such a facility currently in the Five-Year Defense Plan? Where will this facility be built?

General PIHL. It will take two years to design and four years to build a facility under current peacetime conditions. Funds for such a facility are currently in the Five-Year Plan. The final site selection has not been announced.

MULTI-YEAR PROCUREMENT

Senator LEVIN. General Pihl, ammunition programs seem ideally suited for multi-year contracting.

I understand that four ammunition programs in the fiscal year 1984 budget included at least some multi-year contracting.

Are you looking at increasing the amount of multi-year contracting in the fiscal year 1984 budget?

General PIHL. There are three items in the fiscal year 1984 budget that reflect some multi-year contracting. These items are Projectile 155mm HE ICM, Projectile 155mm ADAM and Cartridge Caliber .50 All Types. Starting with the fiscal year 1985 budget multi-year contracting will be applied to approximately fourteen ammunition line items.

CAL .50 MULTI-YEAR CONTRACT

Senator LEVIN. According to GAO, the Army entered into a three year multi-year contract last year with a private firm to purchase .50 caliber ammunition.

However, before the multi-year contract was signed, it became apparent that the Army's inventory of this ammunition would be greater than the requirement for all three years after just one year of the three year contract.

If this is the case, why did you enter into a multi-year contract for an amount of ammunition that would clearly result in your buying more than you needed?

General PIHL. One of the Secretary of Defense initiatives is to encourage capital investment by private industry. In September 1981, Olin Corporation, East Alton, Illinois proposed to facilitize a totally integrated Caliber .50 ammunition production line at no cost to the Government. Based on the five year forecasted Training Ammunition Authorization Committee (TAAC) requirements, the Under Secretary of the Army made commitments to pursue investment, on a multi-year basis, for production capacity for Caliber .50 Ammunition. In December 1982, a detailed review of the Caliber .50 blank acquisition program was conducted. This included a review of training requirements and cost reduction through multi-year acquisition. Training requirements were reduced under the new Standard and Training Commission (STRAC) concept, however, it was learned that the Army could save $6.8 million through multi-year contracting. In January 1983, a three year multi-year contract was awarded to Olin Corporation.

CANCELLATION OF THE CAL .50 MULTI-YEAR

Senator LEVIN. Have you considered canceling this multi-year contract? Why not?

General PIHL. No, Sir. We have no plans to cancel the multi-year contract. If the fiscal year 1984 and fiscal year 1985 multi-year procurement programs were cancelled the Army would incur a cost penalty of $1,023,750.00 to Olin Corporation.

UNITED STATES VERSUS WARSAW PACT AMMO STOCKS

Senator LEVIN. How do the conventional ammunition stocks of U.S. forces stationed in Europe compare to the stocks of the Warsaw Pact forces deployed along the Western Front in both quantity and quality?

General PIHL. The USSR has [deleted] million metric tons of ammunition for its ground forces either uploaded or stockpiled in Warsaw Pact countries and its Western military districts and another [deleted] million tons in strategic reserve. The total is thus [deleted] million metric tons available for the Warsaw Pact in the event of a major conflict with NATO. This supply amounts to [deleted] days of supply for Pact forces.

Pact ammunition, by most reports, is of excellent quality with a long term shelf life. The Pact's modernization effort over the past decade has assured that modern ammunition stocks are available to complement the proliferation of modern conventional systems developed during the period.

The United States has just over [deleted] million metric tons of ground forces ammunition available for a NATO-Warsaw Pact conventional conflict. A large portion of that ammunition is stockpiled in Europe, and is sufficient for about [deleted] days of conventional combat. These stockpiles are being added to on a pragmatic basis. Our intermediate goal is to achieve [deleted] day stockpile.

The quality of United States ammunition is better than the USSR. The new U.S. Improved Conventional Munitions (ICM) and Rocket Assisted Projectiles (RAP) provide greater lethality, effectiveness and range, but current stocks of these modern rounds are generally enough for only [deleted] days of combat.

NATO VERSUS U.S. CONVENTIONAL AMMO STOCKS

Senator LEVIN. How do the conventional ammunition stocks of our NATO allies along the Western Front compare to U.S. stocks in both quantity and quality?

General PIHL. Our NATO allies' stockpiles vary greatly from one country to another in quantity, sustainability and quality. Germany, Italy, Greece, and Turkey have considerable quantity but lack modern generation projectiles. Our allies, including France, have over [deleted] million metric tons available. The NATO alliance thus has a total of about [deleted] million metric tons of ammunition which is estimated to be able to sustain NATO forces in an intense conventional war with the Warsaw Pact for [deleted] days.

The quality of some allied stockpiles is suspect since the ammunition has been stocked for many years for obsolete weapons systems. However, these nations are modernizing some ammunition stocks as new weapons systems are delivered to their respective forces.

In sum, it may be stated that: (1) the Warsaw Pact ammunition stockpiles are considerably larger than NATO's, and (2) the quality of Warsaw Pact stockpiles are inferior to the United States, but better than many of our NATO allies.

Senator LEVIN. The fiscal 1983 Five-Year Defense Plan, for example, showed that the Army would be able to meet only 30–50 percent of its annual training requirement between fiscal year 1984 and fiscal year 1988.

Earlier this year, the Subcommittee was told of an ongoing effort to review the Army's requirements for training ammunition.

Has this review been completed?

What are the results?

General PIHL. During earlier testimonies the subcommittee was briefed on an Army initiative to establish levels of training ammunition required to attain and sustain specified levels of individual, crew, unit weapons proficiency for both active and reserve components relative to readiness levels. This initiative is called Standards in Training Commission (STRAC). The evaluation of Army's training requirements was started on 16 Apr 1983 in 175+ Army battalions. Evaluation is scheduled to be completed on 16 Oct 1984. Interim results from evaluation will be available in Dec 1983.

TRAINING AMMUNITION

Senator LEVIN. In the fiscal year 1985 budget you have just submitted to OSD and OMB, what percentage of your training ammunition requirements do you meet in each of the next 5 years?

General PIHL. I am unable to discuss the fiscal year 1985 budget. Paragraph 3, OMB Circular A–10, Responsibilities for Disclosure with Respect to the Budget, precludes disclosure of budgetary material prior to transmittal of that budget by the President.

Senator HUMPHREY. We stand adjourned.

[Whereupon, at 1:45, the subcommitee adjourned, subject to the call of the Chair.]

○